

Measles Clinician Fact Sheet

Agent: Rubeola virus, a single-stranded RNA paramyxovirus.

Symptoms:

- The *prodrome* lasts 2-4 days (range 1-7 days). It is characterized by fever, often peaking as high as 103°–105°F, with malaise (tiredness), cough, coryza (runny nose), or conjunctivitis.
 - The *rash* is maculopapular and usually lasts 5–6 days. It begins on the face, and over the next few days extends to the body and extremities. The lesions increase in size and may coalesce (come together). Initially, lesions blanch (lose color) with fingertip pressure. By day 3-4 of the rash, however, most do not blanch with pressure. The skin over the more severely affected areas may slough off. The rash fades first on the face and head, and then disappearing from the body and extremities.
 - *Koplik spots*, blue-white spots that generally develop on the mucosa of the mouth, are a characteristic sign of measles disease. Koplik spots appear 1–2 days before the rash to 1–2 days after the rash.
- Other symptoms associated with measles include anorexia (loss of appetite), diarrhea (especially in infants), and generalized lymphadenopathy (disease of the lymph nodes).

Severity:

Diarrhea, otitis media (ear infection), and pneumonia (viral or bacterial) are the most common complications. Subacute sclerosing panencephalitis (SSPE) is a very rare degenerative central nervous system disease believed to be due to persistent measles virus infection of the brain. Encephalitis, seizures, and death can also occur, although rarely. Pneumonia is the most common cause of death in measles cases. Complications are seen in roughly 30% of all measles cases, and generally occur more frequently in children under 5 years of age and adults over 20 years of age.

Differential Diagnosis:

The differential diagnosis includes, but is not limited to, rubella, fifth disease, enterovirus or adenovirus infection, mononucleosis, scarlet fever, roseola, Kawasaki's disease, Rocky Mountain spotted fever, and drug reaction.

Clinical case definition:

An illness characterized by all the following:

- A generalized rash lasting greater than or equal to 3 days,
- A temperature greater than or equal to 101.0°F (greater than or equal to 38.3°C), and
- Cough, coryza, or conjunctivitis.

Laboratory criteria for diagnosis:

- Positive serologic test for measles immunoglobulin M antibody, or
- Significant rise in measles antibody level by any standard serologic assay, or
- Isolation of measles virus from a clinical specimen.

Case classification:

Suspect: Any febrile illness accompanied by rash.

Probable: A case that meets the clinical case definition, has noncontributory or no serologic or virologic testing, and is not epidemiologically linked to a confirmed case.

Confirmed: A case that is laboratory confirmed (does not need to meet the clinical case definition) or meets the clinical case definition and is epidemiologically linked to a confirmed case.

Epidemiology:

- Humans are the only host.
- Measles is primarily spread through respiratory transmission. However, airborne transmission has been documented in closed areas for up to 2 hours *after* the infected person has left.
- The incubation period from exposure to prodrome averages 10-12 days. From exposure to rash onset averages 14 days (range 7-18 days).
- Measles is contagious 4 days before rash onset to 4 days after rash onset. More than 90% of susceptible contacts will develop disease.

Diagnostic Testing:

Laboratory testing should not be used to rule out measles. Only highly suspect cases that are clinically compatible should be recommended for testing. IgM and IgG serology, viral culture, and RT-PCR should *all* be performed for highly suspect cases.

Serology:

All serum samples should be tested for both IgM and IgG to assist in identifying false positive IgM tests. In all measles serology tests, indirect and direct, rheumatoid factor, parvovirus, rubella, and roseola infections can cause false positive measles IgM because of cross-reactivity. Serum samples should be collected *at least* 3 days (72 hours) after rash onset for IgM titers to reach the threshold level.

Viral Culture and RT-PCR:

Specimens for viral culture and RT-PCR should be collected for every highly suspect case, but should only be tested once serology results are positive. CDC is the only laboratory that performs viral culture and RT-PCR. Urine and throat or nasopharyngeal swabs are appropriate specimens for viral culture and RT-PCR. Ideally, specimens should be collected within the first 3 days (72 hours) of rash onset. If 10 or more days have passed since rash onset, specimens should not be collected.

Treatment:

There is no specific treatment for measles. In children that are immunocompromised or severely ill, the measles virus has demonstrated susceptibility to ribavirin. In communities with a known vitamin A deficiency, a child diagnosed with measles should be administered vitamin A.

Case Management:**Isolation:**

Persons diagnosed with measles should be isolated at home until 7 days after rash onset. Hospitalized cases should be put into airborne isolation for the duration of the illness. Transportation of the patient should be limited.

Management of People Exposed to Measles:**Vaccination:**

Vaccination within 72 hours of exposure in unimmunized persons can provide protection against measles in some cases. If immunization status is unknown, vaccination in an already immune person is not harmful.

Immunoglobulin:

For persons whom vaccination is contraindicated (immunocompromised, pregnant women, and infants less than 1 year of age) IG can provide some protection – either by preventing or reducing the severity of disease. IG should be administered within 6 days of exposure, preferably within 72 hours.

Quarantine:

A person is considered susceptible unless they have documentation of 2 doses of measles vaccine administered at least 1 month apart or they were born prior to 1957. Susceptible persons, if not immunized within 72 hours after exposure, should be quarantined in their home until 21 days after the onset of rash in the last measles case.

Vaccine/ Immunization:

Two doses of measles-containing vaccine (MMR), separated by at least 28 days, are routinely recommended for all children. The first dose is given at 12-15 months of age; the second is given at 4-6 years of age. The immunity level among recipients of 2 doses of vaccine is 99%.

MMR is a live, attenuated vaccine, and therefore pregnant women and persons with an impaired immune system should not receive the vaccine. Non-pregnant women should avoid becoming pregnant within 28 days after the last dose of vaccination. Breastfeeding is not a contraindication for MMR vaccination.

Additional information can be found at www.immunize-utah.org or www.cdc.gov/vaccines.

References:

1. Centers for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. Atkinson W, Hamborsky J, McIntyre L, Wolfe S, eds. 10th ed. Washington DC: Public Health Foundation, 2007.
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3. Control of Communicable Diseases Manual (18th Edition), David L. Heymann MD, Ed., 2004.
4. Red Book: 2003 Report of the Committee on Infectious Diseases (26th Edition), Larry K. Pickering MD, Ed. 2003.

**Utah Department of Health
Office of Epidemiology
June 16, 2008**